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HINTS ABOUT THE NATURE AND TREATMENT
OF THE
ACTIVE CONGESTIVE VARIETY OF
BRIGHT'S DISEASE.

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In a previous article we have had our attention turned to the effects of the retention of simple perspiratory fluid in the system. We have seen that the quantity of sweat which ought to be passed off daily may amount to 5 pounds as a maximum, to $1\frac{3}{4}$ pounds as a minimum, and to $2\frac{1}{2}$ pounds on an average. We have noted how an accumulation of this fluid, going on for days, weeks or months together, may induce general dropsy, preceded by an *oedematous* condition of the kidney; and have cited in corroboration the case of a dropsical patient who was very thirsty, drank largely, and gained 11 pounds in weight in the course of three days from deficient elimination of the cutaneous and urinary secretions. But, in an acute or chronic check of perspiration there is much more than a simple non-elimination of water from the skin; for in one experiment Funke forced out nearly 7 ounces of sweat in one hour, containing $7\frac{1}{2}$ grains of urea, or in the proportion of 180 grains of urea in 24 hours; in another experiment the perspiration amounted to about 18 ounces per hour, containing nearly 10 grains of urea, or at the rate of nearly $\frac{1}{2}$ ounce of urea daily from the skin alone. Hence

a contamination of the blood, with an excess of urea, can be induced by a simple check of perspiration.

Again, Schotten has demonstrated, with the greatest certainty, the presence of *formic* and acetic acids in normal human sweat, and very large quantities of formic acid have been obtained under Lehmann's own inspection; in fact, there is a great preponderance of formic acid, a far smaller quantity of acetic acid, and only traces of butyric or any other acid in natural perspiration.

Carbonate of ammonia occurs in alkaline sweat, especially in that collected from the arm-pits and feet. Lehmann infers, if he may form an opinion from the odor of different kinds of sweat, it is very probable that caproic and metacetic acids, which are closely allied to the butyric, are also often present in perspiration. In many diseases, especially such as are accompanied by an acute exanthematous eruption, there is often a singularly strong smell of metacetic acid. A sulphurous matter must be contained in sweat, for if fluid perspiration is kept in a closed glass we find that a considerable quantity of sulphide of ammonia is formed. But the substance which, next to water, occurs in the largest quantity in this fluid is the chloride of sodium. Finally, 412 cubic inches of carbonic acid gas, and about 200 of nitrogen gas are exhaled per day with the liquid secretion of the sudoriparous glands. The main object of perspiration is the elimination of an excess of water and of certain deleterious substances from the blood; still Peaslee is inclined to believe that mischief results from a check of perspiration, far more because carbonic acid and nitrogen gases cease to be given off, than because urea, formic and acetic acids, chloride of sodium, sulphurous matter and ammonia are retained. However this may be, from $\frac{1}{4}$ to $\frac{1}{2}$ ounce of organic and volatile matter, and 38 grains of mineral substances should be excreted from the skin per day, and this does not happen in Bright's disease; for, the experience of almost every physician agrees with that of Goodfellow, that generally, in all stages of Bright's disease, there is an unusual dryness of the skin, and even during somewhat active exercise there is but little, if any, perspiration—the power of eliminating water seems not only impaired on the part of this great emunctory, but

it is also almost certain that there is a diminished power of excreting some or most of the other constituents of the perspiration. Johnson says there is generally a dryness and harshness of the skin; the cuticular covering seems to be ill nourished and imperfectly formed; there is an unusual desquamation of the cuticular cells, and the exuviae are therefore more than usually great. He is often anxious to point out the fact that suppression of the cutaneous secretion is a frequent cause of such an alteration of the blood as produces disease of the kidneys. Not only is the skin dry, but there is difficulty in some cases of inducing free diaphoresis; now and then a patient will be found whose surface becomes very red under the influence of the hot-air bath; an artificial fever may be produced, but he will not perspire afterwards.

It is evident from the above that from either an acute or chronic suppression of perspiration, irritating substances enough may be retained in the blood to cause a blood poisoning but little less formidable in its effects than the inhalation of the paludal, or scarlatinal miasms; and, in consequence of these materials being conveyed to the kidneys more rapidly than they can be eliminated, they continue to accumulate in their blood, till the circulation through the kidneys is retarded and their functions impeded. It is possible that the excess of urea may narcotize, benumb or paralyze the renal nerves in some cases in the same way that it and opium do the brain, thus allowing passive congestion to arise; or some of the retained acids, especially the formic, may so irritate the kidneys as to produce active congestion, or subacute inflammation. However this may be, in the congestive form of Bright's disease, the kidneys are more or less turgid with blood, and are of a bright red or a dusky brown color; the surface is not unfrequently covered over with minute ecchymotic spots dependent upon the extravasation of blood into the tubes in their convoluted portions. This excessive congestion and extravasation of blood, by obstructing the tubes and interfering with the secretory function of the organ, is the chief source of danger. Professor Alonzo Clark says there is enlargement of the kidney, with no tendency to a white or light color. All the renal vessels are full, and in a thin section the malphigian bodies

are seen often as bright-red spots, retaining the blood while it flows out of the veins. The kidney is loaded and distended with blood, but the characteristic exudations have not yet taken place. It is a state sometimes seen in the acute variety when death occurs early. Were it not for the symptoms, viz., the œdema, the pale complexion, the albumen and often the blood in the urine, the varying conditions of uræmia, etc., it might (and undoubtedly should) be considered as congestion, and nothing more. In some of Dr. Clark's cases the congestion was of a very marked character, so marked that where the kidney was left to drain, without being permitted to dry, (by being wrapt in oil silk,) the weight was diminished $1\frac{1}{2}$ ounces in one instance, in another 2, and in a third 3 ounces.

Watson describes this state of the kidney as one of *sanguine congestion*—the whole organ is gorged with blood, which drips freely from it when it is cut open. It is, in general, large, somewhat flabby, of a deep, dark red, even of a chocolate or purplish color, nearly uniformly diffused, except that the cut surface is usually diversified by still darker tuft-like spots, which have been ascertained to be the malphigian bodies, tinged with blood. This change from the natural appearance of the kidney is evidently of a recent kind; the symptoms are uneasiness, a dull pain in the loins, nausea and vomiting, a very scanty secretion of urine, which is sometimes palpably tinged with blood and always albuminous; occasionally complete suppression of urine, and in most cases sudden and general anasarca, or active, acute dropsy. The mischief done to the kidney is the result of *extreme congestion*, and its actual consequences, viz., the oozing forth of the blood in substance, or of some of its constituents, into the interstitial textures, as well as into the excretory tubes of the kidney; those portions of the extravasated fluid which have no outlet of escape solidify, and thus obliterate the natural texture of the part they have invaded; the emergent veins of the kidney are often obstructed by firm clots of blood; blood casts, or fibrinous coagula moulded in and discharged from the urinary tubules and covered with blood disks, are often found in the urine. But none of these

are necessarily products of inflammation, but merely of acute and severe congestion.

In fact, Dr. Robinson has clearly proved this experimentally, by placing a ligature on the renal vein of a rabbit; in consequence of which the urine became albuminous and bloody; he repeated this operation several times with almost uniform results. Frerichs has tested Dr. Robinson's experiments with a similar result, and, in addition, he observed, what Johnson admits might have been anticipated, that the urine which was albuminous and bloody, also contained *fibrinous casts* of the kidney tubes.

Braun's description is still more minute; he says, in the first stage, that of hyperæmia and commencing exudation, the surface of the kidney is smooth, the capsule easily removed, the plexus of veins on the surface dilated and full of dark blood; the cortical substance is brownish-red, soft, and friable; from the surface of a section there flows a sticky fluid, with which the parenchyma is infiltrated; the pyramidal masses are likewise hyperæmic, and the injection is striped; the mucous membrane of the pelvis and infundibula is swollen and covered with vascular arborescence, and they contain a bloody fluid. Apart from hyperæmia the finer structures of the kidney do not appear to be essentially injured.

Hemorrhagic effusions are very frequently observed, which sometimes take their rise from the glomeruli, sometimes from the vascular plexus of the tubuli uriniferi, sometimes from the veins on the surface of the cortical substance; the generally regular, round vesicles in the cortical substance originate in convoluted tubuli uriniferi being distended with blood; the epithelium of the tubuli uriniferi is, in the first stage, not yet essentially altered, but may generally be distinguished by the ease with which it is separated; the tubuli uriniferi are filled with coagulated or fluid exudation, and appear as homogeneous, transparent cylinders, and sometimes contain blood corpuscles. These so-called fibrin cylinders occur less frequently in the chronic form of the disease.

It is in the decidedly congested kidney that we are most apt to find blood in the urine. Heywood Thompson found blood globules present in fifty-seven cases out of seventy-five of recent

albuminuria. In well advanced cases the blood disappears, or at least it was not found in a single case out of ten. Dr. Clark says it is worthy of notice that very often in the beginning of Bright's disease the urine is sometimes found bloody and oftentimes of a smoky hue. The *smoky* urine is equivalent to the bloody urine, for when the matter that has produced the dark color is collected into a sediment it is found to be blood in some degree disintegrated; a portion is granular matter, and a portion blood globules. The granular matter is of a brown color under the microscope, and is supposed to be derived from the hematine of the blood converted into a substance known as hematoidine. The only difference between bloody and smoky urine is, that the blood has met with some extractive matter which has converted its hematine into hematoidine, almost always of the brown granular variety; and the same agent often causes shriveling and other changes in the appearance of the corpuscles. Dr. Clark considers the significance of smoky urine is the same as that of the bloody urine, so far as the condition of the kidney is concerned, both implying a congested state.

But, according to Dr. Henley, *urohæmatin* may be passed in large quantities, and the urine neither appear bloody or smoky; for it is sometimes largely discharged in the almost colorless urine of anæmia and chlorosis. An immense destruction of blood globules may take place in the body, and their debris be eliminated, so as to be invisible to the eye, until the application of an acid sets it free. Normally colored urine is hence often a treacherous guide to go by. The subjects may be well fed, but will lose flesh and strength without apparent cause; their urine may look natural, but their life's blood may be oozing rapidly away by the kidneys. In some of these obscure cases the excess of urohæmatin is so great that when set free by an acid and taken up with ether, the mass, after standing, solidifies into a red-currant jelly-like mass, and may actually be cut with a knife. To detect urohæmatin, add one part of strong nitric acid to three parts of urine, bring it to the boiling point, and if there is much urohæmatin it will assume an *intensely red hue*. Or boil four ounces of urine with some nitric acid, to set all the coloring matter free; when cool, put the urine in a six-ounce bottle, with an ounce of ether, cork the bottle thoroughly,

shake it well, and place it aside for twenty-four hours; at the end of that time the ounce of ether will sometimes be converted into a red, tremulous mass or jelly. In one case, the urine of a young man was almost colorless, like water, while in another it was of a deep-red color from hæmaturia; when strong hydrochloric acid was added to the colorless urine it rapidly assumed a port-wine *red* tint, while, when added to the bloody urine, the acid actually destroyed the color it already had; the pale urine had an excess of urohæmatin which was liberated by the acid; whereas, the red urine only contained a number of free, blood corpuscles, which became coagulated, and as the coloring matter in them is small, no sooner were their cell-walls destroyed, and the contained hæmato-globulin set free and precipitated, than the red color of the urine disappeared. Sometimes the urohæmatin may be in a free state, and the urine will be red before any acid is added, or pale-yellow in color, or brown. Then different acids may act differently; in one case, nitric, sulphuric, and muriatic acids, may give exactly the same results; in others, muriatic acid may turn the urine red, and nitric only make it yellow; in other cases, sulphuric acid may develop the color best. Urohæmatin patients may only have an irregular kind of dyspepsia, with occasional pain in the epigastrium; they may take plenty of food and be in easy circumstances, yet lose fifteen or twenty pounds of flesh per year, and grow weaker all the time. The urine in the worst form becomes neutral or alkaline; like albuminuria, it is apt to come on after diphtheria, pneumonia, and fever and ague, or after a fit of gout, and during convalescence from all severe diseases. But it is in the anemia and chlorosis of both males and females, and the many obscure affections of that class, that it becomes a dangerous symptom, and may precede the development of Bright's disease. It should be looked for in obstinate cases of so-called nervous debility. Dr. Clark lays some stress upon the occurrence of dyspepsia in Bright's disease; he thinks very few cases run their course without the occurrence of very marked dyspepsia, and that almost always of the flatulent variety, with a sense of oppression, and not unfrequently of fullness, or sometimes of emptiness across the epigastric region, and which will persist not unfre-

quently for weeks and months together. By the symptoms alone we can not distinguish the dyspepsia of Bright's disease from that arising from loss of urohæmatin; but an examination of the urine will clear up the matter at once.

Basham describes another form of discoloration of the urine by acid of a different significance from the above, viz., on the addition of nitric acid to urine *already coagulated* by heat, the albumen becomes altered in color, first assuming a *bluish green* and subsequently passing into a *greenish black*. This effect of nitric acid on the albuminous coagula results, he thinks, probably from the oxydizing agency of the nitric acid on the coloring matter of the urine, but adds that it has not yet been satisfactorily explained; but is known to occur most frequently in the acute form of Bright's disease, and is generally of very unfavorable significance; for his experience tells him that the development of this pigmentary condition, in combination with albumen in the urine is of the gravest import. It is always associated with a rapid and advanced state of renal degeneration, and has always been quickly followed by fatal results. He also quotes Lehmann, who says, as far as his experience goes, it is only when uræmic symptoms have or are about to manifest themselves, that this peculiarity of the urine is observable.

Epithelial cells and casts are also often found in the urine in simple but more or less severe and acute congestive Bright's disease. As long as the epithelial cells maintain their normal shape, size and appearance, congestion only is present; but as soon as they become abortive, or undergo some other morbid change, or are accompanied by compound cells, (Gluge's,) or other evidence of fatty or granular exudation, then either the inflammatory form of Bright's disease is present, or has been superadded; or fatty or some other degeneration of the renal tissues has occurred.

It is evident from all that has been proven above, that the principal part of the treatment of the acute congestive variety of Bright's disease should be the restoration of the functions of the skin. For this purpose the *hot-air* bath is better than any vapor or water bath; but I have seen great benefit ensue from the addition of several or many ounces of carbonate of soda, or of a few ounces of spirits of ammonia to an ordinary warm

bath, repeated daily, or several times a week. Persons who scarcely recollected ever having perspired before have done so after these baths; the skin has become soft and moist, and could be kept so if the patient was forced to wear flannel clothing from head to foot, with or without the superaddition of a complete suit of oil-silk; which latter often becomes very necessary in the coldest months of the year.

Dry or wet cups to the loins are often useful, but perhaps not more so than stimulating applications, such as mustard water, made with two handfuls of mustard tied in a muslin bag, placed in hot water, and squeezed with the hand, until all the strength of the mustard is extracted; a thick, broad flannel or towel, long enough to reach entirely around the loins and abdomen, may be wet with this infusion, and worn, covered with oil-silk.

Of the remedies for internal congestion, the most efficient is a combination of tincture of root of aconite, tincture of *veratrum viride*, tincture of *digitalis*, and tincture of *colchicum*. All these medicines tend to equalize the circulation, while aconite is a specific antiphlogistic diaphoretic, *digitalis* a specific antiphlogistic diuretic, and *colchicum* unloads the biliary and intestinal capillaries; finally, all these remedies eliminate urea from the blood.

